



YIDUOZYME Series M

β -Mannanase Preparation
Powder and Granular



TO BE THE WORLD'S LEADING BIOTECH COMPANY



Add: No.8, Pingbei Rd.1, Science & Technology Industry Zone, Nanping, Zhuhai, Guangdong, China.
Tel: 86-756-8676888 Fax: 86-756-8674437 P.C.: 519060
Email: vtr@vtrbio.com Http://www.yiduoli.com



Yiduozyme B-Mannanase

Yiduozyme M series products were developed by VTR Biotech with the international leading technology of bioengineering strains. Through the submerged liquid fermentation production process as well as the comprehensive application of many after-treatment technologies, β-mannanase preparation was finally developed. Due to the high enzyme activity, the various preparations as well as their high efficiency these products can meet different needs of mannanase clients.

The Function of Yiduozyme β-Mannanase

Main Functions

- Degrades β-mannan in feed ingredients such as soybean meal, guar bean meal, palm meal, coconut meal, cottonseed meal, rapeseed meal, etc., and reduces anti-nutritional effects of mannan, so improving feed utilization and animal growth performance accordingly;
- Increases the secretion of insulin and insulin-like growth factors IGF-1, and improves energy utilization efficiency by encouraging glucan digestion and carbohydrate metabolism.
- Improves gut flora and integrity of mucous membranes, leading to modulation of the immunity system and better growth performance of animals.
- Absorbs mycotoxins. Researches indicate that the degradation products, mannan-oligosaccharide, can eliminate mycotoxins by physical absorption or direct bonding, and remove any harmful effects of mycotoxins to animals.
- Lowers FCR and shortens breeding time with improved uniformity of slaughter weight.

Distribution and β-Mannan Content in Feed Ingredients

Mannan most widely distributes and takes the major part in the botanical feed ingredients. As the secondly fraction of hemicellulose, mannan series have been found greatly in the natural world. β-mannan belongs to the non-starch polysaccharides (NSP), which is the main component of seed type plant, it takes the major part in palm kernel meal, coconut meal, and sesame meal and can be found greatly in other botanical feed ingredients. The contents of mannan in the common used feed ingredients and the percentage of mannan in NSP was shown in table 1 and table 2.

Table 1. β-Mannan Contents in Feed Ingredients

Ingredients	β-mannan Contents(%DM)	Ingredients	β-mannan Contents(%DM)
Palm kernel meal	30-35	Peanut meal	0.51
Coconut meal	25-30	Sunflower cake	0.57
Soybean husk	10-12	Rice bran	0.32
Sesame meal	2.8-3.5	Wheat	0.10
Soybean meal (44%)	1.5-1.7	Wheat bran	0.07
Soybean meal (48%)	1.2-1.3	Corn	0.09
Rapeseed meal	0.49	Sorghum	0.09
Cottonseed meal	0.36	Barley	0.49

Table 2. β-Mannan Content in Non-Starch Polysaccharides (NSP) in Some Feed Ingredients

Ingredients	Corn	Soybean meal	Wheat	Rapeseed meal	Bran husk	Sorghum
β-Mannan Contents in non-starch polysaccharides (%)	11.7	22.7	11.9	19.6	33.7	12.2

It is shown in table 1 and table 2 that the percentage of mannan in palm kernel meal and coconut meal is about 30%; meanwhile, there is a high percentage of β-mannan in sesame meal and soybean meal, too. These ingredients, especially the soybean meal, are the main source of feed protein as well as the necessary ingredients of feed. The anti-digestive viscous polysaccharides, being the major part in that corn-soybean meal diet, is mannan. The mannan fraction in NSP of corn and soybean are 11.7% and 22.7%, respectively.

The Anti-Nutrition Effect of β -Mannan

Studies proved that β -mannan and its derivatives polysaccharide bodies have a strong ability to block nutrients absorption. β -mannan, especially water-soluble β -mannan, has great anti-nutrition effect, i.e. even if there is a little amount of β -mannan in feed materials that it will cause a very bad effect in blocking absorption of nutrients for livestock and poultry (mainly for monogastric animals). It may result in the trophism diarrhea and reduce animal growth, as well as nutrients utilization, reduce the egg weight and laying rate thus affects the economic benefit of the raisers.

β -mannan, can increase the viscosity of the dig_esta, affect digestion and absorption of nutrients and it can affect the secretion of insulin and the insulin-like factor IGF-1 as well, so it can reduce animal performance; it can absorb water that is 7 times of its own weight as well as absorb varieties of trace elements to reduce their bioavailability. Since there is no mannanase in the endogenous digestive enzyme system of livestock and poultry, addition of exogenous mannanase in order to degrade mannan is necessary.

β -mannan is the major component of anti-nutritional factor of non-starch polysaccharides (NSP), its anti-nutrition effect can be summarized as the following two aspects:

Reduce the digestion and absorption of nutrients, affect diet conversion rate and animal performance.

Interaction with microorganism system in the back-end alimentary canal thus result in anaerobic fermentation and produce a large amount of clostridium which will produce mycotoxin, so as to inhibit animal growth.

The Mechanism of Yiduozyme β -Mannanase

β -mannase (β -1,4-D-mannase, EC 3.2.1.78) is a kind of hemicellulose hydrolase which can degrade β -1, 4-glycosidic bond and the non-reducing terminal of the degradation product is mannan-oligosaccharide, the action substrates being the β -mannan, galactomannan and gluco-mannan.

β -mannase can degrade β -mannan, decrease digesta viscosity and destroy the structure cell wall of the botanical feed. Mannan-oligosaccharide, being the degradation product, it can improve the microorganism flora in the intestine and improve the intestinal mucosa integrity.

β -mannase can degrade β -mannan, eliminate anti-nutrition effect of β -mannan, increase the feed digestibility and improve the secretion of insulin and the production of insulin-like growth factor IGF-1, so as to improve the absorption of glucose and the metabolism of carbohydrate to make better use of energy. Meanwhile, IGF-1 is the real growth regulatory factor of livestock and poultry and it mediates the growth effect of the growth hormone (GH). Acting on the growth organization and stimulating the amino acid utilization of the cells, it helps the protein synthesis, eliminates the decomposition of protein and helps the protein net growth of animals.

β -mannase can also degrade mannan into mannan-oligosaccharide, which is good for the intestinal microorganism population and plays a good health function to the host, moreover, the mannan-oligosaccharide can distinguish, bond to the pathogenic microorganism and then eliminate them, it can regulate body immune thus improve the performance of the livestock and poultry. Mannan-oligosaccharide can competitively combine with certain pathogenic bacteria in the animal bodies and improve the proliferation of beneficial bacteria. By these, reduce the contact between the pathogenic bacteria and epithelial cells of the intestinal mucosa, greatly reduce the incidence rate and help the animal bodies grow healthy, thus achieve the goal of disease prophylaxis, resistance and finally cure. In the mean time, researches show that mannan-oligosaccharide, produced by degradation, can eliminate the harmful effect of mycotoxin on livestock and poultry by physical absorption or direct integration.

Problems Solved by Yiduozyme β -Mannanase

- β -mannanase can degrade β -mannan, eliminate the anti-nutrition effect of mannan, increase nutrients utilization and improve animal performance.
- By degrade β -mannan, it improves the secretion of insulin and the formation of insulin-like growth factor IGF-1, thus improves glucose absorption, metabolism of carbohydrate and increases energy efficiency.
- Under stress conditions, β -mannanase can greatly improve the growth performance of livestock and poultry.
- Reducing feed conversion ratio, shorten marketing time and improve the uniformity of the marketing poultry and livestock.
- The degradation product mannan-oligosaccharide can improve the intestinal microorganism population and the integrity of intestinal mucosa, do good to animal health, mediate the immune system and improve the produce performance.
- Adsorb mycotoxin. Researches show that the mannan-oligosaccharide can eliminate the harmful effect of mycotoxin on livestock and poultry by physical absorption or direct integration.





The Application Advantages of Yiduozyme β -Mannanase Products

Energy Benefit: Researches show that Yiduozyme β -mannanase has obvious energy benefit. When added into livestock or poultry diets, it releases energy of about 50-100 kcal/kg. Since β -mannan has strong anti-nutrition effect which can reduce the secretion of insulin to prevent glucose absorption and utilization thus leads to the low rate of feed utilization, β -mannanase is necessary to degrade β -mannan in feed and at the mean time, eliminate its anti-nutrition effect, in particular, eliminate the negative effects caused by β -mannan on body's insulin secretion thus improve feed utilization. In conclusion, there exists obvious energy benefit due to the addition of β -mannanase in feed.

The Applicational Advantages of Yiduozyme β -Mannanase in Broilers and Their Breeders

It requires high energy level in broiler diet. A certain amount of fat has to be added into its feed to meet its energy needs while it costs too high to add vegetable oil; however, if animal fat is chosen, more problems emerge: the oil quality, the strict restriction of animal oil addition in and out of China. β -mannanase, which has great energy benefit and, when added into feed, can reduce a certain amount of oil thus it has good economic benefit, too.

The weight equality of broiler improved greatly after the use of β -mannanase, which indicates that it plays an obvious role to the same marketing time of the broiler and production of the same specification of chicken meat.

It can reduce the use of raw animal materials such as fish meal, meat and bone meal and animal lipid.

The Applicational Advantages of Yiduozyme β -Mannanase in Pig Feed

β -mannan affects pigs' performance mainly at their youngage. When the piglets start weaning and begin to eat starter diet, diarrhea is the most common-seen disease. There're mainly two reasons: they are not maturely developed in their alimentary tract and they are lack of the digestive enzymeand, the anti-nutrition effects of anti-nutrition factors in the soybean meal (mainly β -mannan) will cause trophism diarrhea. β -mannanase, as it can degrade β -mannan, can reduce the diarrhea incidence of the piglets. On the other hand, the degradation product, mannan-oligosaccharide, can improve the intestinal microorganism bacteria population and the integrity of the intestinal mucosa. Furthermore, the addition of β -mannase in pig diets can also reduce the use of oil thus save cost.

In general, adding β -mannanase in pig diet will on one hand, make full use of the energy benefit, and reduce oil consumption or offset the energy deficiency,so it can save cost; on the other hand, the use of enzyme preparations can increase the digestion and absorption rate and do goods to animal growth. From the two reasons mentioned above, we dare to say that β -mannanase improves economic benefit for the breeding industry. In addition to this reducing the use of animal protein and animal fat plays asignificant role in cutting down disease transmission and in the process of green food production.

The Product Preparations:

Powder; Granular

Directions:

Direct addition to improve feed quality

Adjust the formulation to reduce digestible energy (metabolizable energy) of 50-100 kcal/kg. This guarantee the stable feed quality while cut down the formulation cost with the addition of this product.

Ask for necessary technical support when the formulation adjustment is needed.

Recommended Dosage:

Add this product 100-150 g/t into compound feed. Add into concentrated feed and premixed feed according the corresponding dosage in compound feed.

Precautions:

Since the addition amount is very small, this product should be premixed with some feed and then mixed with larger quantity. Make sure they are well-mixed.

If there is remainder after used, the inner and outer bag should be tightened against moisture.

Package:

Powder product: 25 kg paper-plastic bag
Granular product: 20 kg / drum.

